

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS:

1. (currently amended) A method for extracting feature quantities of a binary image ~~for extracting feature quantities such as an area, a circumferential length, end points, a center of gravity, and a moment of an image area~~ by scanning, ~~by a raster scanning method or the like,~~ image data that is a binary image to be displayed in one frame, ~~characterized by~~ comprising the steps of:

A) in scanning one line of image data, when a detected pixel has a prescribed density, checking [[a]] an image area content of each of a first pixel immediately preceding the detected pixel on the same one line and a content of a second pixel that is on an immediately preceding line and right above the detected pixel to determine, based on the image area content, if the detected pixel belongs to an image area of the first pixel or an image area of the second pixel ~~when a pixel having a prescribed density is detected in scanning one line of image data;~~

B) when the detected pixel belongs to the image area of the first pixel or the image area of the second pixel, having the detected pixel inherit inheriting an area number of the one image area of the first pixel and the second pixel to which the detected

~~pixel was determined to belong when the detected pixel belongs to the same image area as one of the above pixels;~~

C) performing the above processing steps A)-B) sequentially on succeeding pixels to store resulting image data in a line buffer;

D) after the scanning of the one line has been completed, scanning the line buffer in a reverse direction and modifying the image area content of consecutive pixels having different area numbers to have the a same area number when the consecutive pixels belong to respective image areas but have different area numbers ~~after the scanning of the one line has completed~~; and

E) repeating the ~~same~~ line scanning of steps A)-D) to a last line of one frame to store feature quantities for each image area.

2. (currently amended) A method for extracting feature quantities of a binary image according to claim 1, comprising the steps of:

~~checking a content of each of a pixel immediately preceding the detected pixel on the same line and a pixel that is on an immediately preceding line and right above the detected pixel when a pixel having a prescribed density is detected in scanning one line of the image data; and~~

when step A) determines that the detected pixel belongs to both the image area of the first pixel and the image area of the second pixel, having the detected pixel inherit the inheriting an area number of the image area of the second pixel right above the detected pixel, the first pixel and the second pixel belonging to different image areas with priority given to it when the detected pixel belongs to image areas of both of the above pixels.

3. (currently amended) A method for extracting feature quantities of a binary image according to claim 1, further comprising a step of, after step B), performing scanning of the one line of the image data to identify provide N pixels (N being an integer greater than or equal to 1) that follows [[an]] a first image area having a prescribed first area number that has just terminated, the N pixels forming [[as]] semi-image areas of an adjacent the first image area.

4. (currently amended) A method for extracting feature quantities of a binary image according to claim 1, further comprising a step of performing, after step B), scanning one line of the image data, on the immediately preceding line, to identify provide N pixels (N being an integer greater than or equal to 1) that follows an image area having the same area number that has just terminated as semi-image areas of an image area that is adjacent from right above when the image area having a prescribed

area number terminated at the pixel that is located right above on immediately preceding line.

5. (currently amended) A method for extracting feature quantities of a binary image ~~according claim 3,~~ further comprising a step of scanning, after the scanning of the one line has completed according to claim 3, the line buffer in a reverse direction and modifying the different area numbers to ~~[[the]]~~ a common area number when identifying consecutive pixels belong to respective image areas and semi-image areas but ~~have~~ having different area numbers ~~after the scanning of the one line has completed.~~

6. (currently amended) A method for extracting feature quantities of a binary image according to claim 2, further comprising a step of, after step B), performing scanning of the one line of the image data to identify ~~provide~~ N pixels (N being an integer greater than or equal to 1) that follows ~~[[an]]~~ a first image area having a prescribed first area number that has just terminated, the N pixels forming ~~[[as]]~~ semi-image areas ~~of an adjacent~~ the first image area.

7. (currently amended) A method for extracting feature quantities of a binary image according to claim 2, further comprising a step of performing, after step B), scanning one line

of the image data, on the immediately preceding line, to identify  
~~provide~~ N pixels (N being an integer greater than or equal to 1)  
that follows an image area having the same area number that has  
just terminated as semi-image areas of an image area that is  
adjacent from right above when the image area having a prescribed  
area number terminated at the pixel that is located right above  
on immediately preceding line.

8. (currently amended) A method for extracting feature  
quantities of a binary image ~~according claim 4,~~ further  
comprising a step of scanning, after the scanning of the one line  
has completed according to claim 4, the line buffer in a reverse  
direction and modifying the different area numbers to ~~[[the]]~~ a  
common area number when identifying consecutive pixels belong to  
respective image areas and semi-image areas but ~~have~~ having  
different area numbers ~~after the scanning of the one line has~~  
completed.

9. (new) The method for extracting feature quantities of  
a binary image of claim 1, wherein, the feature quantities are an  
area, a circumferential length, end points, a center of gravity,  
and a moment of an image area.

10. (new) The method for extracting feature quantities of a binary image of claim 1, wherein, the scanning is a raster scanning method.

11. (new) A method for extracting feature quantities of a binary image by scanning, image data that is a binary image to be displayed in one frame, comprising the steps of:

A) scanning one line of image data, when a detected pixel has a prescribed density, checking an image area content of only each of a first pixel immediately preceding the detected pixel on the one line and a content of a second pixel that is on an immediately preceding line and right above the detected pixel to determine, based on the image area content, if the detected pixel belongs to a first image area of the first pixel or a second image area of the second pixel;

B) when the detected pixel belongs to one of the first and second image areas, having the detected pixel inherit an area number of one of the first and second image areas to which the detected pixel was determined to belong;

C) performing the above processing steps A)-B) sequentially on succeeding pixels to store resulting image data in a line buffer;

D) after the scanning of the one line has been completed, scanning the line buffer in a reverse direction and modifying the image area content of consecutive pixels having

different area numbers to have a same area number when the consecutive pixels belong to respective image areas but have different area numbers; and

E) repeating the line scanning of steps A)-D) to a last line of one frame to store feature quantities for each image area.

12. (new) A method for extracting feature quantities of a binary image according to claim 1, comprising the further step of:

when step A) determines that the detected pixel belongs to both the first image area of the first pixel and the second image area of the second pixel, having the detected pixel inherit the area number of the second image area of the second pixel right above the detected pixel.

13. (new) A method for extracting feature quantities of a binary image according to claim 11, further comprising a step of, after step B), performing scanning of the one line of the image data to identify N pixels (N being an integer greater than or equal to 1) that follows a just-terminated image area having a prescribed area number that has just terminated, the N pixels forming semi-image areas adjacent the just-terminated image area.

14. (new) A method for extracting feature quantities of a binary image according to claim 11, further comprising a step of performing, after step B), scanning one line of the image data, on the immediately preceding line, to identify N pixels (N being an integer greater than or equal to 1) that follows an image area having the same area number that has just terminated as semi-image areas of an image area that is adjacent from right above when the image area having a prescribed area number terminated at the pixel that is located right above on immediately preceding line.

15. (new) A method for extracting feature quantities of a binary image further comprising a step of scanning, after the scanning of the one line has completed according to claim 13, the line buffer in a reverse direction and modifying the different area numbers to a common area number when identifying consecutive pixels belong to respective image areas and semi-image areas but having different area numbers.

16. (new) A method for extracting feature quantities of a binary image according to claim 12, further comprising a step of, after step B), performing scanning of the one line of the image data to identify N pixels (N being an integer greater than or equal to 1) that follows a just-terminated image area having a prescribed first area number that has just terminated,



the N pixels forming semi-image areas adjacent the just-terminated image area.

17. (new) A method for extracting feature quantities of a binary image according to claim 12, further comprising a step of performing, after step B), scanning one line of the image data, on the immediately preceding line, to identify N pixels (N being an integer greater than or equal to 1) that follows an image area having the same area number that has just terminated as semi-image areas of an image area that is adjacent from right above when the image area having a prescribed area number terminated at the pixel that is located right above on immediately preceding line.

18. (new) A method for extracting feature quantities of a binary image further comprising a step of scanning, after the scanning of the one line has completed according to claim 14, the line buffer in a reverse direction and modifying the different area numbers to a common area number when identifying consecutive pixels belong to respective image areas and semi-image areas but having different area numbers.

19. (new) The method for extracting feature quantities of a binary image of claim 11, wherein, the feature quantities are

an area, a circumferential length, end points, a center of gravity, and a moment of an image area.

20. (new) The method for extracting feature quantities of a binary image of claim 1, wherein, the scanning is a raster scanning method.